

CLAIMS

What is claimed and desired to be covered by Letters Patent is as follows:

1. An anti-escape mechanism for use by law enforcement officers comprising:
 - a) a first hollow tubular housing having
 - (1) a first end,
 - (2) a second end,
 - (3) a longitudinal axis extending between the first end of said first hollow tubular housing and the second end of said first hollow tubular housing,
 - (4) a blind-ended bore defined between the first end of said first hollow tubular housing and the second end of said first tubular housing,
 - (5) an inner surface adjacent to the blind-ended bore, the inner surface of said first hollow tubular housing having an internal dimension,
 - (6) an outer surface, the outer surface of said first hollow tubular housing having an outer dimension,
 - (7) a seal element ledge mounted on the inner surface of said first hollow tubular housing

- adjacent to the second end of said first hollow tubular housing,
- (8) a seal element mounted on the seal element ledge,
- (9) an end cap on the first end of said first hollow tubular housing,
- (10) a fluid valve mounted on said first hollow tubular housing adjacent to the first end of said first hollow tubular housing, the fluid valve being in fluid communication with the blind-ended bore, and
- (11) a pivot connection element on said first hollow tubular housing adjacent to the first end of said first hollow tubular housing, the pivot connection element being adapted to pivotally connect said first hollow tubular housing to an underneath surface of a law enforcement vehicle, said first hollow tubular housing being pivotally movable between a stored position with the second end of said first hollow tubular housing located adjacent to the underneath surface of the law enforcement vehicle and a deployed position with the second end of said first hollow

tubular housing located spaced apart from the underneath surface of the law enforcement vehicle;

- b) a second hollow tubular housing
 - (1) a first end,
 - (2) a second end,
 - (3) a longitudinal axis extending between the first end of said second hollow tubular housing and the second end of said second hollow tubular housing, the longitudinal axis of said second hollow housing being co-linear with the longitudinal axis of said first hollow tubular housing,
 - (4) a blind-ended bore defined between the first end of said second hollow tubular housing and the second end of said second tubular housing,
 - (5) an inner surface adjacent to the blind-ended bore of said second hollow tubular housing, the inner surface of said second hollow tubular housing having an internal dimension,
 - (6) an outer surface, the outer surface of said second hollow tubular housing having an outer dimension, the outer dimension of said

second hollow tubular housing being smaller than the inner dimension of said first hollow tubular housing,

- (7) the outer surface of said second hollow tubular housing slidably engaging the seal element mounted on the inner surface of said first hollow tubular housing adjacent to the second end of said first hollow tubular housing,
- (8) an end cap on the first end of said second hollow tubular housing, the end cap on the first end of said second hollow tubular housing having a fluid passage therethrough, the fluid passage of said second hollow tubular housing fluidically connecting the blind-ended bore of said first hollow tubular housing to the blind-ended bore of said second hollow tubular housing,
- (9) a housing stop on the end cap of said second hollow housing, the housing stop extending outward from the end cap of said second hollow housing towards the inner surface of said first hollow tubular housing,
- (10) a stop element mounted on the inner surface

of said second hollow tubular housing adjacent to the second end of said second hollow tubular housing, and

- (11) said second hollow tubular housing being telescopingly accommodated in said first hollow tubular housing and moving between a closed position with the end cap on the first end of said second hollow tubular housing being located adjacent to the end cap on the first end of said first hollow tubular housing and an open position with the housing stop on the end cap of said second hollow housing abutting the seal element mounted on the inner surface of said first hollow tubular housing adjacent to the second end of said first hollow tubular housing;
- c) a fluid chamber defined in the blind-ended bore of said first hollow tubular housing between the inner surface of said first hollow tubular housing and the outer surface of said second hollow tubular housing, said fluid chamber being fluidically connected to the fluid valve mounted on said first hollow tubular housing;
- d) a return spring mounted on the end cap on the

first end of said first hollow tubular housing,
said return spring having a first end fixed to the
end cap on the first end of said first hollow
tubular housing and a second end fixed to the end
cap on the first end of said second hollow tubular
housing, said return spring biasing said second
hollow tubular housing towards the closed
position;

- e) a push rod located in the blind-ended bore of said
second hollow tubular housing, the push rod
including
- (1) a first end,
 - (2) a second end,
 - (3) a longitudinal axis extending between the
first end of said push rod and the second end
of said push rod, the longitudinal axis of
said push rod being co-linear with the
longitudinal axis of said second hollow
tubular housing,
 - (4) an outer surface having an outer dimension
which is smaller than the inner dimension of
said second hollow tubular housing,
 - (5) a stop element on the first end of said push
rod, the stop element on the first end of

said push rod extending outwardly from the outer surface of said push rod towards the inner surface of said second hollow tubular housing, and

(6) said push rod being telescopingly accommodated in said second hollow tubular housing and moving between a stored position with the end cap on the first end of said push rod being located adjacent to the end cap on the first end of said second hollow tubular housing and an extended position with the stop on the end cap of said push rod abutting the stop element mounted on the inner surface of said second hollow tubular housing adjacent to the second end of said second hollow tubular housing;

f) a wheel unit mounted on the second end of said push rod for movement therewith, said wheel unit including

(1) a U-shaped wheel mount having a bight section fixedly mounted on the second end of said push rod, two legs attached to the bight section and extending with said push rod in the direction of the longitudinal axis of

said push rod, a wheel axle mounted on the legs of the wheel mount and extending transverse to the longitudinal axis of said push rod, and

(2) a wheel rotatably mounted on the axle to rotate around the axle, the wheel being adapted to rotationally engage a ground surface when said push rod is in the extended position and said second hollow tubular housing is in the open position and said first hollow tubular housing is in the deployed position;

g) a calibrated spring encircling said push rod, said calibrated spring having a first end contacting the stop element on the first end of said push rod and a second end contacting the stop element mounted on the inner surface of said second hollow tubular housing adjacent to the second end of said second hollow tubular housing, said calibrated spring biasing said push rod towards the stored position, the calibrated spring having a spring force that is greater than the spring force of the return spring;

h) a source of fluid fluidically connected to the

fluid valve on said first hollow tubular housing, said source of fluid having a fluid pressure greater than the pressure exerted on the end cap on said push rod from the calibrated spring and greater than the pressure exerted on the end cap of said second hollow tubular housing from the return spring;

- i) a tire-piercing spike unit which includes two identical wing elements, each wing element including
 - (1) a first pivot connection mounted on said push rod for movement therewith,
 - (2) a second pivot connection mounted on the second end of said second hollow tubular housing for movement therewith, said first pivot connection moving relative to the second pivot connection as said push rod moves relative to said second hollow tubular housing,
 - (3) a first arm element having a proximal end pivotally connected to said first pivot connection and a distal end spaced apart from the outer surface of said push rod, the first arm element being pivotally movable between a

stored position with the distal end of the first arm element located adjacent to the outer surface of said push rod and a deployed position with the distal end of the first arm element spaced apart from the outer surface of said push rod,

- (4) a second arm element having a proximal end pivotally connected to said second pivot connection and a distal end spaced apart from the outer surface of said second hollow tubular housing, the distal end of the second arm element being pivotally connected to the distal end of the first arm element, the second arm element being pivotally movable between a stored position with the distal end of the second arm element located adjacent to the outer surface of said first hollow tubular housing and a deployed position with the distal end of the second arm element spaced apart from the outer surface of said first hollow tubular housing, and
- (5) a spiked arm having a proximal end pivotally connected to the distal end of the second arm element and a distal end, the spiked arm

being pivotally movable between a stored condition in which the spiked arm is oriented to extend in the direction of the longitudinal axis of said first hollow tubular housing and a deployed position in which the spiked arm is oriented to extend transverse to the longitudinal axis of said first hollow tubular housing, the spiked arm further including a multiplicity of tire-piercing spikes thereon, the spiked arm being in the deployed condition when said push rod is in the extended position and said second hollow tubular housing is in the open position and said first hollow tubular housing is in the deployed position; and

- j) a device control unit mounted on the law enforcement vehicle and including
 - (1) a foot pedal unit which includes
 - (A) a foot pedal,
 - (B) a pedal arm having a proximal end and a distal end, the foot pedal being mounted on the distal end of the pedal arm,
 - (C) a pivot element pivotally connecting the proximal end of the pedal arm to the law

- enforcement vehicle, the pedal arm being pivotally movable between a device-storing position and a device-deploying position,
- (D) a lock unit on the pedal arm which locks the pedal arm in position,
 - (E) a pedal arm spring having a first end connected to the law enforcement vehicle and a second end connected to the pedal arm, the pedal arm spring biasing the pedal arm toward the device deploying position,
 - (F) lock unit release unit movably mounted on the law enforcement vehicle and having a first end connected to the lock unit and a second end located inside the law enforcement vehicle, the lock unit being movable between a locking position in which the lock unit is locked and an unlocking position in which the lock unit is unlocked and free to move between the device-storing position and the device-deploying position, and
 - (G) a cable having a proximal end fixedly

connected to the pedal arm for movement therewith and a distal end fixedly connected to said first hollow tubular housing to move said first tubular hollow housing from the deployed position towards the stored position as the pedal arm moves from the device deploying position towards the device-storing position and to allow said first hollow tubular housing to move towards the deployed position as the pedal arm moves towards the device-deploying position.

2. A device for preventing an automobile from fleeing from a law enforcement vehicle after being stopped by the law enforcement vehicle comprising:
 - a) a hydraulic unit adapted to be pivotally mounted on the undersurface of a law enforcement vehicle near the front end of the law enforcement vehicle, said hydraulic unit pivotally moving between a stored position and a deployed position, said hydraulic unit including a housing, a longitudinal axis of the housing, a push rod telescopingly

accommodated in the housing and a wheel rotatably mounted on the push rod, the wheel being adapted to contact a ground surface adjacent to the law enforcement vehicle when said hydraulic unit is in the deployed position, the push rod being located inside the housing when the hydraulic unit is in the stored position;

- b) a biasing element connected to the push rod and biasing the push rod towards the inside of the housing;
- c) a second biasing element inside the housing;
- d) a source of fluid on the law enforcement vehicle and fluidically connected to the housing of said hydraulic unit;
- e) a tire-piercing spike unit on said hydraulic unit, said tire-piercing spike unit being movable between a stored position and a deployed position, the tire-piercing spike unit being in the deployed position when said hydraulic unit is in the deployed position, said tire-piercing spike unit including
 - (1) two arms having tire-piercing spikes thereon, and
 - (2) an actuating lever unit movably connecting

each arm of the two arms to said hydraulic unit, each arm of the two arms being movable between a stored position and a deployed position, each arm of the two arms being in the deployed position when said hydraulic unit is in the deployed position; and

- f) a device control unit which includes
 - (1) a foot pedal located inside the law enforcement vehicle, the foot pedal being movable between a device-deploying position and a device-storing position,
 - (2) a lock unit on the foot pedal,
 - (3) a lock release in the law enforcement vehicle and connected to the lock unit, and
 - (4) a cable connecting the foot pedal to the housing of said hydraulic unit, said hydraulic unit being in the deployed position when the foot pedal is in the device-deploying position.